THE JOURNAL

—OF THE—

76252

FRANKLIN INSTITUTE,

DEVOTED TO

SCIENCE AND THE MECHANIC ARTS.

EDITED BY

Prof. Edwin J. Houston, A.M., Ph.D., Chairman; Prof. Arthur Beardsley C.E., Ph.D., Mr. Theo. D. Rand, Prof. Coleman Sellers, E.D., Mr. Alfred C. Harrison, Committee on Publications, with the Assistance of Dr. Wm. H. Wahl, Secretary of the Institute.

VOL. CXLIII.—Nos. 853-858.

JANUARY-JUNE, 1897.

PHILADELPHIA:

Published by the Institute, at the Hall, 15 South Seventh Street.

1897.

THE JOURNAL

OF THE

FRANKLIN INSTITUTE,

DEVOTED TO

SCIENCE AND THE MECHANIC ARTS.

VOL. CXLIII.—Nos. 889-894.

JANUARY-JUNE, 1897.

PHILADELPHIA:
Published by the Institute at the Hall of the Society, Nos. 16 and 18 South Seventh Street.
1897.

JOURNAL OF THE FRANKLIN INSTITUTE.

Vol. CXLIII.—January-June, 1897.

INDEX.

Acetylene 76
decomposition of. (Moissan) 147
explosive properties of 74
gas in Philadelphia 461
modern methods of lighting compared. (Jacobus) 364
Aluminum alloys 145
Bradley patent decision 316
manufacture, domestic, in 1896 235
electrical conductivity of. (Richards and Thompson) . . . 195
manufacture in Europe 148
Amber, production of 76
American industries, the future of. (Outerbridge) 110
Arctic exploration 239
Artificial light; modern methods compared. (Jacobus) 364
Ayer, Ira. The tin plate industry in the United States 424
Balch, Edwin S. Ice caves and the causes of subterranean ice 161
Banes, Charles Henry. Memorial of 308
Batteries, thermo-electric 461
Beadle, Clayton. Viscose and viscoid 1
Book Notices:
Weston. Loss of head due to friction in pipes 77
Campbell. Structural steel 157
Dykerhoff-Carter. Influence of sea water on hydraulic mortars . . 157
Bauschinger-Carter. Uniform methods of testing materials, etc. . . 158
Lewis. Friction and lubrication in horology 158
Swoope. Lessons in electricity 158
Bradley aluminum patent decision 316
Buck, Chas. A. A new laboratory grinder 194
Budd, Edward G. An all-wrought steel pulley 447
Calcium carbide as a reducing agent. (Warren) 383
Car building in 1896 238
Car-wheel metal, chilled, transverse strength of, etc. (Whitney) . . . 267
Carborundum, manufacture and development of, at Niagara Falls. (Fitzgerald) 81
production and use of 156, 387
Chassagne's process of color photography 384
Chemistry of the pottery industry. (Langenbeck) 321
Compound locomotives, performance of, etc. (*See* Cooper.)

Compressed air for city and suburban traction. (Haupt) 13, 119
Cooper, John H. Report of tests of "Cascade" water-wheel 376
Results of the working of two-cylinder compound locomotives on American railways 26
Copper, electrolytic refining 154
Crank-shafts, speed variations in. (Starkweather) 132
Cyanide process for the treatment of gold ores. (Richards) 96

Dunn, B. W. A photographic method of measuring the intensities of impulsive forces 320
Durand, W. F. Graphical determination of the index of the power according to which one quantity varies relative to another 188
Dynamos, compound-wound, etc. (Keller) 200

Electric energy direct from carbon 315
Electric lighting and traction 314
Electrical conductivity of aluminum. (Richards and Thompson) . . . 195
Electro-capillary light 318
Electrolytic copper refining 154

Fitzgerald, Francis A. Manufacture of carborundum at Niagara Falls, 81
Frankel, Lee K. Food adulteration and the pure food law 241

FRANKLIN INSTITUTE:

Board of Managers, Annual Report for 1896 140
Committee on Science and the Arts.
Abstracts of reports.
Leclere's black-prints 389
Peacock's piston packing 389
Koepcke's sand track 389
Jarrett's self-cleansing filter 390
Almond's flexible metallic tube 390
Cox's knife-sharpening attachment 464
Kent's battery-motor 464
Lewis' rotary steam engine 464
Hollingshead's disinfectant ejector 464
Election of officers, managers, etc. 159
Mining and Metallurgical Section. Organization of 392
Nominations for officers, managers, etc. 79
Proceedings of stated meetings, December, 1896, to May, 1897, ... 79, 159, 240, 320, 388, 464
Rand, Theo. D. Election as Vice-President 320
Resolutions favoring holding exhibition 80
Smoke nuisance. Communication from Board of Health requesting co-operation of the Institute 320
Wilson, Joseph M. Resolutions of thanks to, ... 160
Wolf, Otto C. Election of, to the Board of Managers 160

Gold ores. The cyanide process for the treatment of. (Richards) . . . 96
Grinder for laboratory use. (Buck) 14

Hallowell, Frederick Fraley. Memorial of Robert Wright 452
Hatt, W. Kendrick. An efficiency surface for Pelton motor 455
Haupt, Herman. Compressed air for city and suburban traction . . 13, 119
Heilprin, Angelo. Report as delegate to the Hungarian Millennial . . 160
Holophane globes. (Elliott) 80

Ice caves and the causes of subterranean ice. (Balch) 161
Interrupter for induction coils, improved, automatic. (Sayen-Willyoung) 231

Jacobus, D. S. Artificial light; modern methods compared, etc., . . 364
Jacques carbon generator 238
Jenkins, C. Francis. The phantoscope 80

Keller, E. R. Equalizing connections for compound-wound dynamos coupled in multiple 200
Kitsee, I. Auxiliary telegraphy 68

Lake waterway, the, ... 318
Langenbeck, Carl. The chemistry of the pottery industry 321
Latent heats of fusion of metals and their melting points, relations between. (Richards) 379
Lewis, Wm. T. Observations on magnetized watches 60
Locomotives, two-cylinder compound. Performance of, on American railways. (Cooper) 26
Lucium, a new (?) element 75

Magnetic concentrating process, Wetherill's. (Nitze) 279
Magnetized watches, observations on. (Lewis) 60
Mason, W. P. Sanitary problems connected with municipal water supply, 337
Melting points and latent heats of fusion of metals, relations between. (Richards) 379
Mineral and metal production in United States in 1896 238
production of Germany 462
Moissan, H. Decomposition of acetylene 147
pure uranium 147
Municipal water supply, sanitary problems connected with. (Mason) . 337

Niagara power utilization 154, 237
Nitze, H. B. C. The Wetherill magnetic concentrating process 279

OBITUARY NOTICES:

Charles Henry Banes 308
Robert Wright 452

Outerbridge, A. E., Jr. The advantages of mechanical stoking 160
The future of American industries 110
The smoke nuisance and its abatement 393
Pelton motor, an efficiency surface for. (Hatt) 455
Petroleum, origin of 316
Photography in natural colors 384
Pottery industry, chemistry of. (Langenbeck) 321

Power transmission at Niagara 154
Pulley, an all-wrought steel 447
Resins, recent advances in the study of. (Trimble) 178
Richards, Jos. W. Cyanide process for gold ores 96
Relations between the melting points and latent heats of fusion of metals 379
and Thompson, John A. Recent determinations of the electrical conductivity of aluminum . . . 195
Rowand, Lewis G. Improved safety device for electric circuits . . . 357
Safety device for electric circuits. (Rowand) 357
Sanitary problems connected with municipal water supply. (Mason) . 321
Sayen, H. Lyman. (*See* Willyoung and Sayen.)
Slate production in the U. S. 386
Smoke nuisance in Philadelphia, discussion, resolutions 393, 465
Soil ferments important in agriculture. (Wiley) 293
Speed variations in crank shafts. (Starkweather) 132
Starkweather, George P. Speed variations in crank shafts 132
Steam and other heat motors, the standard of efficiency of. (Thurston) . 37
Stevens Institute of Technology, twenty-fifth anniversary 74
Storage battery in Europe 156
Synchronograph, the ; a new system of telegraphy. (Squier and Crehore) 464
Syntheses effected at low temperatures. (Pictet) 147
Technical brevities 386
Telegraphy, auxiliary. (Kitsee) 68
without wires 317
Thermo-electric batteries 461
Thompson, John A. (*See* Richards and Thompson.)
Thurston, R. H. The standard of efficiency for steam and other heat motors 37
Tin plate industry in the United States. (Ayer) 424
Trimble, Henry. Recent advances in the study of the resins 178
Viscose and viscoid. (Beadle) 1
Warren, H. N. Calcium carbide as a reducing agent 383
Watches, magnetized. (Lewis) 60
Water-wheel. Report of tests of "Cascade" wheel. (Cooper) 376
Wetherill magnetic concentrating process. (Nitze) 279
Whitney, A. W. Transverse strength of chilled car wheel metal, etc., 267
Wiley, Harvey W. Soil ferments important in agriculture 293
Willyoung, E. G., and H. L. Sayen. X-ray apparatus and methods . . 211
Improved automatic interrupter for induction coils, 231
Wright, Robert, memorial of 452
X-rays, apparatus and methods. (Willyoung-Sayen) 211